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Surplus Crop Production and the Small Reclamation Projects Act

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SURPLUS CROP PRODUCTION AND THE SMALL RECLAMATION PROJECTS ACT. By Donald H. Negri, Michael R. Moore, C. Edwin Young, Larry J. Schluntz, Dick L. Porter, and Ronald M. Willhite. Resources and Technology Division, Economic Research Service, U.S. Department of Agriculture. Agricultural Economic Report No. 592.

ABSTRACT

The U.S. Department of the Interior's Small Reclamation Projects Act (SRPA) program, by providing aid to improve existing irrigation systems, can increase irrigated acreage and crop production. The U.S. Department of Agriculture's commodity programs concurrently use target prices and acreage restrictions to cut production of surplus crops, namely corn, sorghum, oats, barley, wheat, rice, and upland cotton. This report reviews the links between SRPA loans and surplus crop production, and associated commodity program costs. The apparent conflict between the two programs is minor. A small percentage of USDA commodity program expenditures can be attributed to SRPA loans, and SRPA acres produce a small portion of USDA surplus crops.

Keywords: Irrigation, production, program costs, Small Reclamation Projects Act (SRPA), surplus crops

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PREFACE

This report results from a joint study by the U.S. Department of Agriculture (USDA) and the U.S. Department of the Interior. Section 311 of Public Law 99-456 requires that the Secretary of Agriculture and the Secretary of the Interior review the effects of the Small Reclamation Projects Act of 1956, Public Law 84-984, as amended, on the operation and objectives of USDA programs dealing with the production of surplus commodities. This report was prepared to satisfy that requirement. Regional offices of the Bureau of Reclamation, Department of the Interior, collected the data on the small reclamation projects for this study.

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GLOSSARY

Deficiency payment. Government payment made to farmers who participate in feed grain, wheat, rice, or cotton programs. The payment rate is per bushel, bale, pound, or hundredweight and is based on the difference between a target price and the higher of either the market price or the loan rate.

Loan rate. The dollar amount per unit (bushel, bale, pound, or hundredweight) at which the Commodity Credit Corporation (CCC) will provide loans to farmers.

Market price. The weighted average price received by farmers during a specific period.

Nonrecourse loan. Eligible producers may obtain a loan from the CCC by pledging stored crops as collateral. These loans enable farmers to hold their crops for later sale. The producer can settle the loan by turning the stored commodity over to the Government. The Government has no recourse but to accept the commodity as complete settlement for the loan.

Target price. A unit value established by law for wheat, feed grains, rice, and cotton, which is used to calculate income-supporting deficiency payments.

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SUMMARY

The apparent conflict between two Federal programs affecting agriculture--one encouraging production and the other restricting production--is in fact minor.

The U.S. Department of the Interior's Small Reclamation Projects Act (SRPA), by providing aid to improve existing irrigation systems, can increase irrigated acreage and crop production. The U.S. Department of Agriculture's (USDA) commodity programs aim to reduce production through target prices, price support loans, and acreage restrictions for seven surplus crops. A small percentage of USDA commodity program expenditures can be attributed to SRPA loans, and SRPA acres produce a small percentage of USDA program crops.

This report reviews the links between SRPA loans and surplus crop production, and USDA commodity program costs associated with that production.

Through 1987, 75 small reclamation projects have been completed, 18 projects are under construction, and 11 loan applications for projects are being considered. The estimated annual Federal cost for providing interest-subsidized SRPA loans was $12 million in 1984, declining to about $11 million annually between 1986 and 1990 for the SRPA projects completed by 1985.

Between 1975 and 1985, SRPA production declined for five of the seven USDA program crops: corn, sorghum, oats, barley, and wheat. Compared with national production, SRPA irrigation districts devoted larger shares of their acreage to nonprogram crops such as fruits, nuts, vegetables, and seeds, and to the remaining two USDA program crops, rice and upland cotton.

In 1985, USDA deficiency payments for the production of program crops in irrigation districts receiving SRPA loans were $60 million, of which only about $8 million came from production linked to SRPA. A few large districts dominate the estimates of SRPA-linked program costs, production, and irrigated acreage. These districts also received large irrigation loans, indicating that large loans correlate with increased irrigated acreage. In projects completed by 1985, irrigated acreage expanded in seven of the nine districts receiving loans in excess of $5 million. In these districts, acreage expanded 24 percent after the date of loan application, compared with an average of 8 percent in all districts receiving loans.

Surplus Crop Production and the Small Reclamation Projects Act

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INTRODUCTION

This study explores the apparent conflict between U.S. Department of Agriculture commodity programs and subsidies for irrigation provided by the U.S. Department of the Interior's Small Reclamation Projects Act (SRPA). The SRPA subsidizes the costs and increases the availability of farm irrigation water. Thus, the SRPA may encourage farmers to grow crops, some of which are in surplus. USDA commodity programs use target prices and acreage restrictions to cut production of surplus crops.

Consistency between Federal programs is an important consideration when designing legislation, especially in this era of high deficits and tight budgets. Fox, Moore, and Stults examined the apparent conflict of goals between the Federal reclamation program and commodity programs, and concluded that: "reclamation programs emphasize, among other objectives, maintaining and expanding agricultural capacity over time," while "commodity programs emphasize short-term price and income levels and stability" (1).1/

The apparent conflicts among the objectives of U.S. Department of Agriculture (USDA) commodity programs and soil conservation programs were debated in the early 1980's. Studies by Reichelderfer and by Osteen identified the incentives to expand production of somewhat erosive crops created by USDA price and income support programs, while other USDA programs subsidized implementation of soil conservation practices (2, 3). The 1985 Food Security Act, through the conservation title, attempts to reconcile the inconsistencies in these programs.

This report estimates the share of USDA commodity program production within several irrigation districts that results from the SRPA program. Only a small percentage of USDA commodity program expenditures go to SRPA projects, indicating little actual inconsistency between the two programs.

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1/ Underscored numbers in parentheses refer to literature cited in the References section.

SRPA PROGRAM DESCRIPTION

Constructing and operating small irrigation and reclamation projects is a part of water resources development that often can be performed by local agencies to their own and the Federal Government's benefit. The SRPA was enacted on August 6, 1956, to encourage local participation in the development and rehabilitation of small reclamation projects. SRPA provides Federal assistance to those projects and requires that an organization applying for a loan submit a proposal to the Secretary of the Interior. The proposal "shall set forth, among other things, a plan and estimated cost in detail comparable to those included in preauthorization reports required for a Federal reclamation project."

The Bureau of Reclamation, U.S. Department of the Interior, processes all SRPA loan applications and proposals. The Bureau provides advice during preparation of the required loan application report, examines the stated feasibility to determine whether the project can reasonably be expected to accomplish its purpose, and decides whether the loan can be repaid as proposed. Also, the Bureau reviews plans and inspects the project when necessary, both during construction and throughout the loan repayment period, to verify that the project is built and managed according to the contractual agreements.

Key provisions of the SRPA legislation permit simplified planning, review, and authorizing procedures, and require that the local sponsor construct and operate the project. The local sponsor makes key decisions within the Federal guidelines developed for the program.

A small reclamation project must include commercial irrigation as a primary purpose. However, projects may be multipurpose, including municipal and industrial (M&I) water supply, commercial hydroelectric power, flood control, fish and wildlife enhancement, or outdoor recreation. Recent legislation gives special emphasis to rehabilitating and improving existing projects.

Interest-free Federal loans are available for financing irrigation facilities, and interest-bearing loans can be acquired for the M&I water supply and power purposes. Loans must be repaid within 40 years and generally require 25 percent local (upfront) contribution to qualify. Grants may be made for part of the flood control, outdoor recreation, and fish and wildlife enhancement purposes when they are of general public benefit.

Small reclamation projects originally were limited to those requiring $10 million or less, with the sum of loans and grants limited to $5 million. For 1987, the estimated maximum allowable project cost was $42.1 million, and the allowable sum of loans and grants was limited to $28.1 million, or two-thirds of the maximum allowable project cost. In addition to these individual project cost limitations, Congress also imposed a $1.2 billion Federal appropriation ceiling for carrying out provisions of the program.

Since the program's inception in 1956, 104 projects have been either completed, are pending approval, or have applications (reports) under consideration. These projects required a total Federal contribution (loans and grants) of about $736 million, a local contribution of about $222 million, and a total project cost of almost $960 million. Local applicants' upfront contributions have averaged 23 percent for the 103 projects formulated since 1956. This results in an average Federal obligation of 77 percent. The

average loan repayment period has been 38 years. Table 1 describes the status of the SRPA program as of April 1, 1987. The analysis presented later in the report is based on projects completed through 1985. In addition to the projects listed in table 1, 25 Notices of Intent from applicants represent projects in the planning stage and, potentially, more than $345 million in Federal appropriations.

The subsidy associated with the interest-free and interest-subsidized loans is an important aspect of the SRPA evaluation. In effect, loans with below-market-level interest rates create a Federal expenditure: the Government lends interest-free while paying interest on the money it borrows. In the mid-1970's, the Secretary of the Interior placed a ceiling on the interest subsidy on a loan. The ceiling, called the "loan factor," requires that the ratio of the interest subsidy to the loan principal be less than 50 percent. For example, on a $20,000 loan made in 1987, the present discounted value (PDV) of the series of loan repayments cannot be less than $10,000.

The loan factor requirement has contributed to a shift in the structure of the loans being made and the nature of the districts that receive them. Since the early 1980's, the applicants' upfront share of costs have increased from an average of 23 percent to an average of 27 percent. The average loan repayment period for recently completed projects has decreased to 30 years, from the overall average of 38 years. In addition, the bulk of loan applications shifted from single-purpose irrigation projects to multipurpose projects. Of the 20 projects reviewed in the 1980's, for example, only 5 were solely irrigation projects. Loans for multipurpose projects typically contain interest-bearing components in the municipal and industrial portions of the projects.

The Federal Government incurs nonreimbursable costs in the form of interest subsidies because the Government makes interest-free SRPA loans while

Table 1--SRPA project costs and applicant contributions by project status, April 1987

Project Status	Projects 1/	Federal appropriations (loans/grants)	Applicant contributions	Total project costs
	Number	$ million		
Construction completed	76	270.2	60.3	330.5
Under construction	21	284.6	70.8	355.4
Applications under consideration	12	181.0	90.7	271.7
Total	109	735.8	221.8	957.6

1/ Some SRPA irrigation districts receive more than one SRPA loan.

borrowing at an interest rate. The 1985 cost to the Government from the interest-free and interest-subsidized loans, calculated at a 7.5-percent interest rate, was $12 million. As the loan principal is repaid, the projected costs from these loans decline to around $11 million per year between 1986 and 1990. These figures are based on projects completed by 1985. As other projects are approved and completed, the nonreimbursable costs will increase. Table 1 indicates future nonreimbursable costs. Total Federal appropriations for the projects under construction in 1987 were $284.6 million, while appropriations for construction completed were $270.2 million. Only the latter were included in the calculations of the annual cost of the interest-subsidized loans.

CCC COMMODITY PROGRAMS

The Secretary of Agriculture administers a comprehensive framework of target prices, price support loans, and acreage restrictions for specified crops. The program crops discussed in this report are wheat, oats, upland cotton, rice, corn, barley, and sorghum. In addition, a farmer-owned grain reserve exists for wheat and feed grains. The goals of these commodity programs are stabilizing farm income and gradually reducing farm surpluses through reduced production and expanded trade. The general framework of current commodity programs is authorized in accordance with provisions of the Agricultural Act of 1949, as amended by the Food Security Act of 1985.

Annual expenditures by the Federal Government for farm commodity programs may come in any of three primary forms:

(1) Expenditures associated with price and income supports. The Government price support loan program guarantees participating farmers a price level (a target price) per unit of production. By pledging a quantity of commodity as collateral, farmers obtain loans from the CCC at an interest rate generally at or below the market-level interest rate. Loans are made at a fixed rate per unit of the commodity. At harvest time, if market prices are above the guaranteed price level, farmers may sell their commodities at the higher value and repay the loan, thus realizing a profit. If market prices are lower, the CCC acquires stocks when commodity producers with outstanding loans forfeit their loan collateral rather than repay the loans. These loans are known as nonrecourse loans. Commodity producers generally will forfeit loan collateral to the CCC only when the loan rate exceeds the market price. Compliance with acreage restrictions and other program requirements qualifies a commodity producer for price support loans and other benefits. Government expenditures for income support to farmers participating in commodity programs are known as deficiency payments. Deficiency payments and storage costs represent the bulk of total USDA program costs.

(2) Payments for land diversion (PLD's) that induce an additional reduction of planted acreage beyond that required to qualify for price and income supports. To encourage further acreage reduction, the CCC provides payments for diverting additional land from production. These PLD's are calculated by multiplying the diversion payment rate for a particular crop by the quantity of acreage idled times the producer's established yield for the crop. A farmer with highly erodible land must establish an approved conservation plan for use on the farm through 1990 and must begin the conservation plan to be eligible for commodity program benefits.

(3) Costs associated with storing surplus commodities. Once acquired or purchased by the CCC, the commodities must be placed in storage. CCC storage costs represent the third major category of Federal expenditures in CCC commodity programs.

The 1985 Act includes provisions aimed at increasing the world competitiveness of upland cotton and rice by using marketing loans and negotiable marketing certificates. The marketing loan provisions allow commodity producers to repay their loans at a level below the initial loan rate whenever the world market price for rice or upland cotton falls below the loan rate. A negotiable marketing certificate may be issued to commodity producers in an amount equal to the difference between the repayment rate and the world market price to enhance the competitiveness of these commodities. These provisions encourage producers to sell their rice and upland cotton in the world market rather than forfeit their crops to the CCC.

The 1949 Act also contains provisions for a milk price support program. The CCC buys surplus dairy products to maintain the market price for milk at the price support level. Because forage is an input into milk production, increased forage production may stimulate milk production. This could increase CCC purchases of dairy products. Irrigated forage, consequently, is another commodity that is important for the evaluation of CCC program crop production attributable to SRPA loans.

Specific aspects of the commodity programs are designed for each crop. Yet, a majority of the programs have in common the three categories of Federal costs. This report links these costs to the specific crop production made possible by SRPA loans.

THE SRPA INFLUENCE ON CROP PRODUCTION AND CCC COMMODITY PROGRAM COSTS

When analyzing the SRPA influence on crop production and CCC commodity program costs, we considered the conceptual effects, the estimation methods, and the actual crop production and CCC expenditures on lands benefitting from SRPA loans.

Conceptual Effects of SRPA on Crop Production and Composition

Agricultural production and its composition depend on the current and anticipated economic conditions of input markets (including farm labor, chemicals, energy, and water), output commodity markets (such as commodity prices), and nonmarket phenomena (such as climate and water yield). Changes in any of these conditions affect the level and composition of both the inputs used for production and the production itself. For example, an increase in the price of energy is likely to alter the input composition toward less energy-intensive production methods and to increase the production of less energy-intensive crops. The increased production of less energy-intensive crops will, in turn, affect the prices of agricultural commodities. For instance, if corn prices rise above other commodity prices, corn production will also rise. In an environment in which the economic and noneconomic conditions are continuously changing, assessing the effect of a single-factor change on the agricultural sector can be difficult.

The SRPA subsidizes the cost and potentially increases the availability of one factor of production, irrigation water, for irrigation districts that obtain SRPA project loans. The SRPA can affect surplus crop production and CCC program expenditures by inducing changes in crop mix, expanding irrigated acreage, and/or increasing yield on existing acres. In an ideal situation, program costs attributable to SRPA are precisely those portions of production directly linked to the project loan. But the cost and availability of irrigation water may not be the most important determinants of production. Production changes after an irrigation project has been completed are not always directly attributable to that project facility or to rehabilitation financed by the loan. Factors such as commodity prices, climate, urbanization, and input prices other than water also determine the level and composition of production. Surplus commodity programs are a significant determinant of production. The combined effect of these factors potentially dominates the effect of the irrigation loan. Whether the SRPA increases or decreases program crop expenditures cannot be predicted a priori. For example, when an SRPA project increases irrigated acreage, the project may also induce a shift in crop composition away from surplus crops, causing commodity program expenditures to drop. An increase in the irrigation water supply may induce farmers to expand irrigated acreage and to shift production to higher value, nonprogram crops such as fruits, nuts, and vegetables.

Method for Estimating SRPA Effects on Surplus Commodity Program Expenditures

This section describes the methodology for assessing the effects of SRPA loans on crop production, crop composition, and surplus crop program costs. Specific questions are: (1) What percentage of production within an irrigation district can be attributed to the SRPA project? (2) What are the current and projected program crop costs associated with the SRPA? (3) How does the SRPA project influence the level and composition of production in the districts over time?

Since the irrigation districts receiving SRPA loans had land in irrigated rotation at the time of loan application, not all of the production in these districts can be linked to the irrigation project.2/ Each of these districts presumably would continue to produce nonprogram and program crops in the absence of an SRPA project loan. Some districts may finance the irrigation project through the private capital market. To isolate the influence of an SRPA loan, the expenditure estimates use acreage increases in irrigated rotation since the date of the loan as a proxy for increased crop production due to the SRPA loan. For completed projects, we assume that all irrigated acreage increases since the date of the loan application result directly from the SRPA irrigation project. Thus, the share of total production attributable to an SRPA project equals the share of 1985 acres in irrigated rotation that have been added since the loan application. For example, suppose that 1,000 irrigable acres were added to a district serving 19,000 acres at the date of the SRPA loan application. These acres could have been added any time after the loan application but prior to 1985. The share of the output from the district's irrigated acreage that is attributable to the SRPA project would be

2/ Land in irrigated rotation measures acreage for which irrigation works have been constructed and project water is available. This land exceeds irrigated acreage in any one year.

5 percent, or 1,000 divided by the new total of 20,000. The estimate assumes that the crop distribution on the incremental acreage is identical to the existing crop distribution within the entire district.

For the 67 projects completed by 1985, 1,091,895 acres were in irrigated rotation in these districts at the time of the project applications. In the interval from the date of loan application to 1985, land in irrigated rotation in the 67 completed projects increased 97,943 net acres, or 8.1 percent. This percentage represents incremental commodity production attributable to the SRPA.

The importance of factors other than the SRPA was evident in the overall percentage, as results varied substantially across projects. Despite the 8.1-percent overall increase in acreage in irrigated rotation in 1985, acreage in irrigated rotation on 32 of the projects declined since the date of the loan application. Thirty-three projects increased acreage and two remained unchanged. In those projects where the irrigated acreage declined, the analysis does not attribute any of the irrigation project's crop production to the SRPA. Decreases in irrigated acreage are assumed to result from other determinants of production including urbanization and, therefore, are not attributable to the SRPA.

Projections of the production attributable to the SRPA focus on changes in irrigated acreage and do not extrapolate the trends in crop composition. Determinants of crop composition other than the SRPA are assumed to dominate crop selections. Moreover, this procedure does not necessarily overstate the contribution of the SRPA. For example, an irrigation project loan may expand irrigated acreage, while other factors, such as urbanization, simultaneously may eliminate some irrigated acreage. Thus, the estimate of the district production attributable to the SRPA may be understated.

Crop Production on Land Served by SRPA-Financed Projects

To assess the contribution of irrigation districts with SRPA loans to U.S. crop acreage in 1985, we compared both program and nonprogram crop acreage in these irrigation districts with national averages (table 2).

Description of Status

Seven program crops (corn, sorghum, oats, barley, wheat, rice, and upland cotton) are grown on irrigated acreage in the West, the primary domain of the SRPA. Acreage devoted to these crops in 1985 accounted for 41.7 percent of total acreage on land with SRPA projects completed by that year. U.S. acreage devoted to the same crops was 47 percent. Yields on irrigated land, however, were significantly higher. A smaller share of irrigated land in SRPA irrigation districts is devoted to program crops compared with the national average. Although this holds true for the program crops as a group, acreage devoted to barley, rice, and upland cotton in SRPA irrigation districts exceeds the national averages.

The use of SRPA acreage is somewhat skewed toward the production of nonprogram crops. In particular, high-value crops, such as vegetables, seeds, nuts, and fruits, are produced at rates higher than the national average. The prevalence of SRPA loans in the high-value agricultural production regions of California is a major factor.

Table 2—Harvested acreage in 1985 by crop for the United States and for SRPA irrigation districts

Crop	U.S. harvested acreage	National average land use	Land use in irrigation districts with SRPA loans	Percentage of total SRPA acreage used	Land use in SRPA districts as a percentage of national average land use
	1,000 acres	Percent	1,000 acres	Percent	
Corn for grain	75,224.0	18.7	112.1	11.0	0.15
Sorghum for grain	16,782.0	4.2	11.5	1.1	.07
Oats	8,177.0	2.0	7.1	.7	.09
Barley	11,603.0	2.9	45.7	4.5	.39
Wheat	64,734.0	16.1	58.8	5.8	.09
Rice	2,494.0	.6	108.5	10.7	4.35
Upland cotton	10,229.0	2.5	80.6	7.9	.79
Other cereals	717.0	.2	3.3	.3	.46
Forage 1/	133,145.0	33.0	324.2	31.9	2.43
Miscellaneous crops	70,671.0	17.5	65.6	6.4	.09
Vegetables	4,024.0	1.0	71.8	7.1	1.78
Nursery 2/	NA	NA	3.3	.3	NA
Seeds 3/	1,446.9	.4	17.5	1.7	1.20
Fruits	2,837.1	.7	57.3	5.6	2.02
Nuts	655.8	.2	46.0	4.5	7.01
Family gardens	NA	NA	4.1	.4	NA
Total	402,739.8	100.0	1.017.4	99.9	NA

NA= Not applicable.

1/ The U.S. forage total includes cropland pasture from the 1982 Census of Agriculture.

2/ Acreage values for nurseries and family gardens are not available for the United States, but are assumed to be small and to have little effect on the percentage distribution.

3/ The U.S. seed acreage is for 1980, the last year for which data were available.

Trends in Crop Production and Acreage Since 1975

Table 3 describes the trend in CCC program crop production in irrigation districts receiving SRPA loans. The table reports total district production, only a portion of which can be attributed to SRPA projects. The data are limited to the 32 projects that were finished by 1975 in order to develop trends at three time points (1975, 1980, and 1985). The trends are rough indicators of future production patterns. The table does not imply a causal relationship between the trend and the loan program. Rather, it provides some perspective on possible future CCC commitments and program expenditures.

With the possible exception of rice, the percentages in the table are small. Therefore, total production of program crops in SRPA irrigation districts will not affect commodity prices in general. The potential effect of rice production on price is discussed later in this report. Although not affecting commodity prices, program crop production does affect CCC program crop expenditures. Doubling the percentage of national corn production between 1975 and 1980, for example, doubles the corn deficiency payments to these irrigation districts.

Sorghum, barley, wheat, and rice production in the irrigation districts fell throughout the 10-year period, compared with national production totals. In irrigation districts, corn production doubled by 1980 and remained constant through 1985. Oat production also increased by 1980, yet showed a large net reduction by 1985. Upland cotton production increased by 1980, almost doubling in percentage terms, but declined toward its 1975 base by 1985. Table 4 illustrates some of the changes in cropping patterns since 1975. The trends between the SRPA irrigation districts and the national totals run opposite to each other for sorghum, oats, and wheat production, with sorghum acreage decreasing, oats acreage increasing, and wheat acreage increasing in the districts while decreasing at the national level. The acreage in total

Table 3--Percentage of national production of CCC program crops in irrigation districts receiving SRPA loans, selected years 1/

Crop	1975	1980	1985
		Percent	
Corn	0.01	0.02	0.02
Sorghum	.40	.17	.05
Oats	.05	.07	.01
Barley	.60	.42	.31
Wheat	.13	.13	.12
Rice	5.41	5.32	4.91
Upland cotton	.51	.92	.66

1/ The SRPA projects, the production data of which contribute to the table, were completed by 1975. This permits the development of a trend at three points in time, incorporating data from 32 of the 67 projects completed by 1985.

program crop production also follows this pattern, declining between 1980 and 1985 in the districts, while showing a long-term increase for the U.S. total.

Table 4--Percentage of acreage devoted to CCC program crop production: SRPA irrigation districts versus U.S. total, selected years 1/, 2/

Item	1975	1980	1985
		Percent	
Corn:			
SRPA	1.06	1.90	3.11
United States	16.30	17.70	16.70
Sorghum:			
SRPA	5.96	1.53	.97
United States	3.70	3.00	4.20
Oats:			
SRPA	.62	.69	.89
United States	3.10	2.10	2.00
Barley:			
SRPA	4.37	2.85	3.67
United States	2.10	1.80	2.90
Wheat:			
SRPA	4.37	5.39	5.74
United States	16.70	17.20	16.10
Rice:			
SRPA	15.30	18.40	16.00
United States	.70	.80	.60
Upland cotton:			
SRPA	2.96	8.79	7.13
United States	2.10	3.20	2.50
All program crops:			
SRPA	35.00	39.50	37.50
United States	44.70	45.70	47.00
All nonprogram crops:			
SRPA	65.00	60.50	62.50
United States	55.30	54.30	53.00

1/ The SRPA projects, the production data of which contribute to the table, were those completed by 1975. This permits development of a trend at three points in time, incorporating data for the percentage of harvested acres within SRPA irrigation districts devoted to the specific crop.

2/ U.S. data represent national acreage.

CCC Program Crop Expenditures in SRPA Irrigation Districts

Deficiency expenditures represent payments at the target price. The deficiency payment rate was calculated as target price minus loan rate for all the program crops. The deficiency payment rate is multiplied by production to estimate deficiency payment expenditures. Diversion payments and disaster payments are not included in the calculation since irrigators typically do not participate in these programs.

Description of Status

Total 1985 deficiency payment expenditures in the 67 irrigation districts with completed projects amounted to $59.7 million. Rice and upland cotton production assumed 45 and 30 percent of total expenditures. CCC program crop production, estimated production attributable to SRPA, and the associated deficiency payment expenditures for 1985 are presented in table 5.

To estimate the program costs attributable to the SRPA loans, we adjusted downward the total deficiency payment expenditures to reflect surplus crop production attributable to the SRPA. For 1985, irrigation districts' estimated surplus crop expenditures attributable to the SRPA totaled $8 million, compared with 1985 national deficiency payment expenditures of $5.6 billion by the CCC. The national total included the CCC's storage costs that originated in the CCC price support program and was associated with the crops attributable to the SRPA. We used the national average figures listed above to estimate that total SRPA crop storage costs in 1985 were $177,606. The total storage costs estimate rises to $786,745 if all of the SRPA crops are stored. Rice accounted for 75 percent of the estimated expenditures, and nearly all of this rice was produced in two irrigation districts in California (Glen Colusa and South Sutter). These districts and other large districts that dominate the estimated program costs are examined later in this report.

Expenditure Estimates for 1986-90

Estimates of CCC expenditures for program crops grown in SRPA irrigation districts and attributable to SRPA loans are presented in table 6 for 1986-90. Table 7 presents data on the national average CCC expenditure rates for program crops. These are the rates used in computing the CCC expenditure estimates. The expenditure estimates include CCC annual expenditures for deficiency payments, marketing loan costs, nonrecourse loans and purchases, and CCC storage expenditures for 1986-90. The 1986 present value of the 5 years of payments is $52 million, or $12 million per year, on average. Expenditures for the rice program again constitute a majority of the cost, with more than $31 million, or 60 percent of the total. Program crop expenditures attributable to the SRPA may not end in 1990, but may continue through the useful life of the investment or until crop prices exceed target levels. The estimates end in 1990 because the 1985 Act authorizes deficiency payments through 1990 only.

The projections are grounded in several assumptions: (1) The projections of costs are based on production that is attributable to the SRPA (the figures for district irrigation production are reduced by the adjustment factor). (2) The trends in crop production are not used during the projection period. Production levels and crop composition in 1985 are assumed to extend to 1990. (3) Production estimates of the 28 SRPA projects under construction in 1985

Table 5—1985 surplus crop production and costs for SRPA irrigation districts 1/

Item	National production 2/	Production attributable to SRPA 3/ 4/	Deficiency payment rate	Total deficiency expenditures in SRPA districts 5/ 6/	Deficiency expenditures attributable to SRPA 7/	1985 national deficiency expenditures	Percentage of national deficiency expenditures attributable to SRPA
	———1,000———		$/Unit	———$1,000———		$ million	Percent
Corn (bu)	14,505.3 (0.16)	1,192 (0.01)	0.48	6,963 (11.7)	572 (7.0)	2,470	0.02
Sorghum (bu)	922.9 (.08)	26 (*)	.82	757 (1.3)	21 (.3)	225	.01
Wheat (bu)	4,594.5 (.19)	659 (.02)	1.08	4,962 (8.3)	712 (8.6)	1,508	.05
Barley (bu)	3,616.7 (.61)	375 (.06)	.52	1,879 (3.1)	195 (2.4)	159	.12
Oats (bu)	526.9 (.10)	40 (*)	.45	237 (0.4)	18 (.2)	8	.23
Rice (cwt)	6,852.8 (5.1)	1,596 (1.2)	3.9	26,726 (44.7)	6,226 (75.1)	374	1.66
Upland cotton (bales)	160.1 (1.2)	5 (.04)	113.76	18,211 (30.5)	548 (6.6)	860	.06
Total	8/	8/	8/	59,735	8,292	5,604	.15

* = Negligible.

1/ Data are for the 67 SRPA projects completed by 1985.

2/ Numbers in parentheses in this column represent the percentage of national production in 1985 that is grown on SRPA irrigation districts.

3/ Estimates of production attributable to the SRPA are obtained by assuming that increases in irrigated acreage in the interval between the date of the SRPA loan application and 1985 result from the SRPA loan. Refer to Section 4 for a complete description of the procedure.

4/ Numbers in parentheses in this column represent the percentage of national production in 1985 that is attributable to the SRPA.

5/ 1985 deficiency expenditures represent payments at the target price. The deficiency payment rate in 1985 was calculated as target price minus loan rate for all of the program crops. The deficiency payment rate is multiplied by production to estimate deficiency payment expenditures. Storage costs estimates are discussed later in this report. Diversion payments and disaster payments are not included in the calculation since irrigators typically do not participate in these programs.

6/ Numbers in parentheses in this column represent the percentage of the SRPA irrigation districts' total deficiency expenditures for each crop.

7/ Numbers in parentheses in this column represent the percentage of total deficiency payment expenditures for each crop that is attributable to the SRPA.

8/ Not able to compute due to variety of unit sizes.

are included in the calculations beginning in 1986 (the estimates assume that the new projects increase acreage in the same proportion as the net increase in the 67 projects completed by 1985, or 8.1 percent, and that the cropping pattern remains unchanged). (4) The deficiency payment, marketing loan costs, nonrecourse loan and purchase expenditures, and crop storage rates used in the calculation of program expenditures are unaffected by the crop production attributable to the SRPA. (5) The estimates assume that eligible SRPA producers participate in the commodity programs at the same rate as the national average participation rates.

Additional CCC costs arise from the link between irrigated forage and the Federal milk program. Because forage is an input into milk production, increases in irrigated forage production conceivably increase the production of dairy products. Increased forage production attributable to the SRPA may

Table 6—Estimated expenditures attributable to SRPA loans on CCC program crops in SRPA irrigation districts, 1986-90 1/

Crop	1986 2/	1987	1988	1989	1990	PDV 3/ 1986-90	Undiscounted sum 1986-90
				$1,000 4/			
Corn	982	1,129	1,056	884	614	4,085	4,664
	(7)	(8)	(8)	(9)	(8)	(8)	(8)
Sorghum	533	568	600	466	280	2,149	2,447
	(4)	(4)	(5)	(5)	(3)	(4)	(4)
Wheat	1,265	943	798	583	383	3,567	3,973
	(9)	(7)	(6)	(6)	(5)	(7)	(7)
Barley	345	448	419	402	333	1,683	1,947
	(2)	(3)	(3)	(4)	(4)	(3)	(3)
Oats	7	6	5	2	0	18	19
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Rice	8,083	8,131	7,954	6,489	5,587	31,688	36,243
	(55)	(60)	(61)	(65)	(69)	(60)	(61)
Upland cotton	3,588	2,413	2,217	1,177	862	9,291	10,256
	(24)	(18)	(17)	(12)	(11)	(18)	(17)
Total	14,803	13,638	13,049	10,003	8,059	52,481	59,549

1/ CCC program expenditures represent the average rate of Federal expenditures per unit of production.

2/ Numbers in parentheses are percentages of the total expenditures on deficiency payments, marketing loan costs, nonrecourse loan and purchase expenditures, and crop storage costs. Numbers may not add to 100 percent due to rounding.

3/ PDV measures the present discounted value in 1986 of the sum of the program expenditures for 1986-90, using an 8-percent discount rate.

4/ 1985 dollars.

stimulate milk production through lower feed prices. Because forage markets tend to be regional, the SRPA may have small but perceptible effects on regional forage prices. Quantifying the effect of the SRPA on milk program costs is difficult because of the alternative uses of forage (other than for dairy production) and the regional nature of the markets.

In 1985, SRPA irrigation districts devoted 324,000 acres to irrigated forage production. Sixteen percent of those acres are attributable to the SRPA, using the adjustment factor described earlier. A single irrigation district, Walker River in Nevada, contributed 40 percent of the forage acreage attributable to the SRPA.

Changes in Commodity Prices as a Result of SRPA

The percentage of national production attributable to the SRPA is small for all program crops except rice (table 5). Without the SRPA, national rice production would decline an estimated 1.2 percent. This is sufficient to cause a change in the market price of rice.

An estimate of the price effect of the SRPA involves a simple calculation. The shortrun domestic price elasticity of demand for rice, reflecting the relationship between domestic use and price, is -0.2. The price elasticity of export demand is -0.75. A 1.2-percent decline in rice production causes a 28-

Table 7--Projected average rate of Federal expenditure per unit of production by crop, 1986-90 1/

Crop	Units	1986	1987	1988	1989	1990
Corn	($/bu)	0.80	0.92	0.86	0.72	0.50
Sorghum	($/bu)	1.20	1.28	1.35	1.05	.63
Wheat	($/bu)	1.65	1.23	1.04	.76	.50
Barley	($/bu)	.60	.78	.73	.70	.58
Oats 2/	($/bu)	.08	.06	.05	.02	0
Rice	($/cwt)	5.02	5.05	4.94	4.03	3.47
Upland cotton	($/bale)	262.57	176.55	162.25	86.12	63.08

1/ Includes deficiency payments, net costs of marketing loans, net costs of nonrecourse loans and purchases, and storage costs per unit of total production rather than per unit of production on farms participating in CCC commodity programs.

2/ Estimates for oats made in early 1986.

SOURCE: Office of Budget and Program Analysis, USDA. Mid-Session Review of President's FY 1987 Budget, July 1986.

cent increase in the market price. The market price of rice in 1985 was $6.53 per hundredweight (cwt). The estimated price with the production decrease is $6.81 per cwt. Without the rice production attributable to the SRPA, the domestic rice price would be higher.

Estimates of CCC deficiency payment costs must be recalculated if the price change results in a new deficiency payment rate. With rice, however, the loan rate was $8.00 per cwt in 1985. For calculating the deficiency payment rate, the loan rate is used whenever it is higher than the market price. In 1985, the price change due to SRPA rice production does not translate into a higher deficiency payment rate. In this case, CCC program costs need not be recalculated.

The 1985 Act also includes a marketing certificate provision designed to promote the competitiveness of rice and upland cotton on the world market. The value of each certificate depends on the prevailing world market price. Because the rice production attributable to the SRPA is a negligible share of world production and trade, there are no price effects after 1985.

Diversion Payments

Diversion payments for reducing planted acreage provide an annual method to adjust crop production. These payments adjust the carryover stock of CCC program crops. In the 1987 farm program, for example, 27.5- and 20.0-percent acreage reductions are required to qualify for wheat and feed grain deficiency payments. Diversion payments are paid to feed grain producers who set aside an additional 15 percent of remaining acreage. The analysis assumes that voluntary diversion payments will not be necessary during the later years of the 1985 Act. The Acreage Reduction and Conservation Reserve programs are likely to adjust acreage sufficiently.

CASE STUDIES

A close inspection of the data reveals that the results largely depend on a small percentage of the irrigation districts. A few large irrigation districts effectively dominate the estimates of program costs attributable to the SRPA. These districts warrant closer examination to understand their effect on program cost estimates.

Rice accounted for 75 percent, or $6 million, of the $8 million in estimated program expenditures attributable to the SRPA in 1985 (table 5). For comparison, deficiency payments for rice on lands attributable to the SRPA account for 1.66 percent of national expenditures for rice. These expenditures can be traced to two irrigation districts in California, Glen Colusa and South Sutter. The two districts combined had 167,694 acres in irrigated rotation in 1985. Of the 67 SRPA projects completed by 1985, Glen Colusa and South Sutter accounted for 14.3 percent of the total acreage in irrigated rotation. Rice is the prevalent crop grown in the two districts, where 75 percent of the harvested acreage was devoted to its production in 1985. Rice production in Glen Colusa and South Sutter accounted for 92 percent of the rice produced in the 67 completed SRPA projects, and for 4.3 percent of national production.

The dominance of these two districts and of rice in the cost estimates attributed to the SRPA is a consequence of the procedure for allocating production to the SRPA. The share of district production attributable to the SRPA depends on the share of 1985 acreage added to land in irrigated rotation since the date of the loan application. In these two projects, 21.5 percent (36,065 acres) of the 1985 irrigated acres was added since the time of the loan application. Thus, surplus crop costs associated with rice constitute a large share of estimated SRPA expenditures for two reasons: (1) Glen Colusa and South Sutter are large irrigation districts growing predominantly rice, and (2) they substantially increased irrigated acreage since the date of the loan application. However, the price of rice increased from $8.11 per cwt in 1978 to $12.80 per cwt in 1980, encouraging rice producers to increase their acreage. Since 1980, prices have declined to less than $8, and rice acreage in the Glen Colusa district also has decreased. Thus, a portion of the increased rice acreage probably resulted from the price increase rather than entirely from the SRPA loan.

The Central Nebraska irrigation district provides another example of a large irrigation district dominating the estimates of program costs attributable to the SRPA. The estimated deficiency payments attributable to the SRPA in Central Nebraska accounted for $441,000 of the $572,100, or 77 percent of the estimated expenditures for corn (table 5). Deficiency payments for corn on lands attributable to the SRPA represent 0.02 percent of national corn expenditures. As with the two California districts, Central Nebraska is a large irrigation district that grows predominantly one crop, and has substantially increased acreage since the date of the loan application. While the irrigated corn acreage increased in the district, the acres had been used for dryland wheat and grain sorghum before the SRPA loan. Any increase in program expenditures, therefore, is due to increased yield from irrigation. Also, the switch from the wheat and sorghum deficiency payment rates to the lower corn deficiency payment rate may have reduced program expenditures (table 7).

These three irrigation districts also received large irrigation loans from the SRPA. Examining the projects receiving the largest irrigation loans reveals a correlation between loan size and increased irrigated acreage. Irrigated acreage expanded in seven of the nine districts with SRPA loans exceeding $5 million (table 8). These districts accounted for the majority of the incremental acreage attributed to the SRPA from the 67 completed projects. In 1985, 82,105 of the 334,590 acres in irrigated rotation, or 24.5 percent, were added to these nine districts after the date of loan application, compared with 6.7 percent for the 67 completed projects. Of the seven districts with substantial increases in irrigated acreage, six grow either CCC program crops or forage.

Valley Center Irrigation District is the major exception, growing exclusively fruit. Examining these large irrigation districts indicates that CCC program costs are sensitive to the composition of production combined with the size of the district receiving an SRPA loan (table 8).

Table 8--Irrigation acreage of the nine projects with SRPA loans exceeding $5 million 1/

Irrigation districts and predominant crops	Acreage in irrigated rotation			Percentage of harvested acres devoted to predominant crops	Percentage of harvested acres devoted to program crops
	At loan application	In 1985	Change in acreage 2/		
	---------Number---------			---------Percent---------	
Glen Colusa, CA (rice)	110,674	129,707	19,033 (14.7)	74.1	81.8
Pond Poso, CA (upland cotton)	22,300	18,688	-3,612 (-19.3)	52.5	57.1
Valley Center, CA (fruit)	9,300	23,294	13,994 (60.1)	100.0	0
Central Neb., NE (corn)	33,642	40,344	6,702 (16.6)	94.3	94.8
Buttonwillow, CA (upland cotton)	54,300	56,576	2,276 (4.02)	50.8	54.6
Ft. Collins, CO (forage)	1,500	1,640	140 (8.5)	3/ 45	40.0
Redwood Val., CA (forage)	585	4,104	3,519 (85.6)	3/ 82.8	0
Tehachapi Cumm., CA (fruit)	2,889	2,801	-88 (-3.1)	4/ 61.8	4/ 0
Nevada, CA (forage)	17,305	57,446	40,141 (69.8)	3/ 77.7	.9
Total	252,495	334,600	82,105	NA	NA

NA= Not applicable.

1/ Includes only those irrigation districts with projects completed by 1985. Information presented on loan size is based on 1982 data.

2/ Numbers in parentheses report the percentage of 1985 acreage in irrigated rotation that has been added (subtracted) since the date of loan application.

3/ Although forage (the predominant crop in this irrigation district) is not a program crop, increased forage production may stimulate milk production. This would link forage production to the CCC price support program for milk.

4/ Based on 1980 data because data for 1985 were unavailable.

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